DRAFT ITEM P-6XX, BITUMINOUS PAVEMENT REJUVENATION[1]

GENERAL

6XX-1.1 Description. This item governs the application of an asphalt pavement rejuvenation product applied to a previously placed hot-mix asphalt (HMA) surface in accordance with these specifications, as shown on the plans, or as directed by the engineer. The purpose of this product is rejuvenation of the upper 3/8 inch of oxidized or otherwise aged asphalt binder without causing an unacceptable reduction in the friction characteristics (skid resistance) of the pavement section. Additionally, the rejuvenation product should not introduce unacceptable pavement distresses such as raveling, high temperature deformation (rutting), and loss of strength. The rejuvenation product should not contribute to accelerated deterioration of the pavement.

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Project Selection. The performance of a rejuvenation product is contingent on the pavement condition at the time of application. The pavement condition survey provides a measure of the pavement condition by analyzing the type, amount, and severity of the distresses, and by determining the pavement condition index (PCI) in accordance with AC 150/5380-6A *Guidelines and Procedures for Maintenance of Airport Pavements* and ASTM D 5340. A typical asphalt pavement candidate for rejuvenation is one without structural, load associated distresses (or has provisions to correct these distresses) and with low to moderate environmental, temperature associated distresses. The recommended corrected PCI should be equal to or greater than 70 to qualify as a candidate for asphalt rejuvenation.

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MATERIAL

6XX-2.1 Rejuvenation Product.

. a. The rejuvenation product must be capable of achieving the minimum changes in the asphalt binder properties shown in Tables 1 or 2 after proper application and field exposure.

. b. The binder extracted per ASTM D 2172, Method A and recovered per ASTM D 1856 or D 5404 from samples of the upper 3/8 inch of the surface of the treated pavement must exhibit the percent decrease in absolute viscosity or complex viscosity and corresponding phase angle increase listed in Table 1 or 2, when compared to the values from adjacent untreated samples from the same pavement in the prescribed timeframe.

[1] In this specification, the term "**rejuvenation product**" will carry the same connotation as the term "rejuvenator" or "rejuvenator/sealer." The term "**rejuvenation product**" will be used throughout this specification for the purpose of simplicity.

. c. The bid submittal must include independent laboratory test results accredited by an American Association of State Highway Transportation Officials (AASHTO) Materials Reference Laboratory (AMRL). The test results should verify the ability of the proposed rejuvenation product to achieve the minimum changes in asphalt binder properties shown in Table 1 or 2.

TABLE 1. Pavement Three (3) Years or Less in Age			
Item #	**Property of Recovered Binder [1]**	**Requirement**	**Test Method**
1	**Absolute Viscosity $_{60°C}$, P**	**≥ 20% Decrease [1]**	**ASTM D 2171**
2a	**Complex Modulus $_{60°C}$, G***		**AASHTO T 315**
2b	**Viscosity $_{60°C}$, η = G* / ώ, Pa·s**		
2c	**Phase Angle $_{60°C}$, δ, °**	**Report**	
TABLE 2. Pavement More Than Three (3) Years in Age			
1	**Absolute Viscosity $_{60°C}$, P**	**≥ 30% Decrease [1]**	**ASTM D 2171**
2a	**Complex Modulus $_{60°C}$, G*, kPa**		**AASHTO T 315**
2b	**Viscosity $_{60°C}$, η* = G* / ώ, Pa·s**		
2c	**Phase Angle $_{60°C}$, δ, °**	**Report**	

[1] Procedures: Sample collection for application and acceptance as noted in this specification. Sample weights and measure by ASTM D 3549; Extraction by: ASTM D 2172, Method A using toluene (conditioning to remove moisture will not be accomplished); Recovery by: ASTM D 1854 (Abson) or ASTM D 5404 (Roto-Vap); and binder extraction, recovery and testing within 48 hours of obtaining pavement cores or equivalent surface area samples.

6XX-2.2 Rejuvenation Documentation/Certification.

.a. Performance. The bid submittal must include documentation of previous use and test data conclusively demonstrating that the rejuvenation product has been used successfully for a period of two or more years by other user agencies; and that the asphalt rejuvenation product has been proven to perform in a manner equivalent to this specification, through field testing by/for using agencies as to the required change in the recovered asphalt binder properties. Testing data must be submitted indicating such product performance from at least two projects representative of two different HMA mix designs, each being tested for a minimum of two years to insure reasonable longevity of the treatment, as well as product consistency. The performance documentation must be presented from a geographically similar climatic region of the United States as that for this project, e.g., wet-warm, wet-cool, dry-warm, and dry-cool.

.b. Friction Characteristics [For Runway and High Speed Taxi Exit Surfaces]**.** The bidder must provide evidence of past performance that the material, a minimum of 48 hours after application, does not cause a decrease in pavement frictional characteristics [skid resistance] below the maintenance planning requirements specified in AC 150/5320-12,

Measurement, Construction, and Maintenance of Skid-resistant Airport Pavement Surfaces, Table 3-2, when tested at the speed of 40 mph with approved continuous friction measuring equipment [CFME].

.c. Health, Safety, and Environment. The bidder shall provide a complete material safety data sheet (MSDS) and the manufacturer's certification that the rejuvenation product compliance with the Code of Federal Regulation Title 40 – Protection of Environment. The manufacturer's certification shall address compliance for Air Programs, Part 59, National Volatile Organic Compound Emission Standards for Consumer and Commercial Products [for the airport location] and Water Programs, Part 116, Designation of Hazardous Substances. The MSDS, Section II, shall include the chemical abstracts service (CAS) registry numbers for all applicable hazardous ingredients in the rejuvenation product.

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1) US Department of Labor, Occupational Safety and Health Administration (OSHA), Regulations (Standards – 29 CFR), 1910.1200 establishes the requirement and minimum information for the MSDS for hazardous materials. The CAS registry numbers for the components identified in the rejuvenation product are the basis for compliance with CFR Title 40 – Protection of the Environment limitations.

2) CFR Title 40 – Protection of Environment, Chapter 1, Environmental Protection Agency, Subchapter C – Air Programs, Part 59, National Volatile Organic Compound Emission Standards for Consumer and Commercial Products, includes a rejuvenation product as a bituminous coating and mastic. The limit in the CRF for bituminous coatings and mastics is 500 grams VOC per liter (4.2 pounds VOC per gallon). The airport may have more restrictive limits than listed in the CFR.

3) CFR Title 40 – Protection of Environment, Chapter 1, Environmental Protection Agency, Subchapter D – Water Programs, Part 116, Designation of Hazardous Substances, lists the elements and compounds that are designated as hazardous substances under the Clean Water Act. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing these substances. The CAS registry numbers are listed for cross-reference with the MSDS.

4) CFR Title 40 – Protection of Environment, Chapter 1, Environmental Protection Agency, Subchapter J – Superfund, Emergency Planning, and Community Right-To-Know Programs, Part 302, Designation, Reportable Quantities, and Notification, identifies reportable quantities for hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act and the Clean Water Act, and sets forth the notification requirements for releases of these substances. The CAS registry numbers are listed for cross-reference with the MSDS.

5) Environmental Protection Agency, EPA 550-B-01-003. Lists of Lists, Consolidated List of chemicals Subject to the Emergency Planning and Community Right-To-Know Act (EPCRA) and Section 112® of the Clean Air Act, October 2001, provides information and includes chemicals subject to reporting requirements under the Emergency Planning and Community Right-to-Know Act (EPCRA), also known as Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA)1, and chemicals listed under section 112(r) of the Clean Air Act (CAA). The CAS registry numbers are listed for cross-reference with the MSDS.

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6XX-2.3 Rejuvenation Product Qualification Procedure and Requirements.

. a. For those materials recently developed or existing materials changed for improvements or other reasons that do not have two years of documented successful performance, conditional acceptance may be obtained by successfully completing the rejuvenation product qualification procedure requirements (RPQPR) outlined in engineering Brief No. XX. The conditional acceptance may be:

- Converted to permanent acceptance, upon successfully completing the two year documented field performance.
- Rescinded, if unacceptable field performance is noted prior to two years.

. b. Any existing rejuvenation product that has undergone a formulation change for any reason or product improvement shall be requalified.

. c. Any existing rejuvenation products meeting the requirements of paragraph 6XX-2.2.a. must be requalified on an eight year basis starting with the dated of this publication.

APPLICATION RATE

6XX-3.1 Test Sections. Prior to full application, the contractor must place a series of test sections (minimum one square yard) at application rates as judged necessary by the manufacturer to establish the appropriate project rejuvenation product application rates for the specific product. As a minimum, a test section is required for each different HMA mix design identified in the project. Additional test sections may be required due to highly variable traffic areas, e.g., taxiway pavement wheel paths versus taxiway edge areas or specific areas identified by the engineer. The contractor must select test sections to obtain pavement cores or saw cut 'slabs' (equivalent surface area samples) in accordance with 6XX – 6.1A. The pavement cores or equivalent surface area samples must be taken 48 hours after application of the rejuvenation test sections and tested in accordance with Table 1 or 2, Item #1 and Item #2a, paragraph 6XX – 2.1 for the purpose

of determining a recommendation for the rejuvenation product application rates. The contractor is responsible for all sampling and testing associated with the test sections.

6XX-3.2 Approval. The contractor and the engineer shall examine the test sections 24 hours after treatment to determine if the entire rejuvenation product has penetrated into the surface. Application rates that have not allowed full penetration into the pavement surface after 24 hours must not be permitted to be used for full production. The application rates for full production must be determined by the contractor and approved by the engineer based on the contractor's recommendation and observation of test sections and test section data from 6XX-3.1.

CONSTRUCTION

6XX-4.1 Worker Safety. The rejuvenation product must be handled with caution. The contractor must obtain a Material Safety Data Sheet (MSDS) for the rejuvenation product and require workmen to follow the manufacturer's recommended safety precautions.

6XX-4.2 Weather Limitations. The rejuvenation product must be applied only when the existing surface is dry and the weather forecast is in accordance with the manufacturer's recommendations for application and curing. The rejuvenation product must not be applied during inclement weather or when rain or freezing temperatures are anticipated within 24 hours before or after application. If weather conditions interfere with application and/or curing, the engineer may at his discretion suspend the job or require remedial action as deemed necessary.

6XX-4.3 Equipment. The contractor must furnish all equipment and hardware necessary for the performance of the work. The rejuvenation product should be delivered in dedicated tankers and/or containers with agitating equipment and filters, per manufacturer's recommendations. The distributor must be designed and equipped in accordance with the manufacturer's recommendations, but include as a minimum, the following characteristics:

.a. Adequate heating capability for rapid heating of the rejuvenator to the proper application temperature.

.b. A positive displacement pump capable of pumping low viscosity material and providing a pre-selected constant pressure to deliver the specified rates of application.

.c. A full circulation spray bar and applicator that maintain proper nozzles, which provide the specified rate of application.

d. A hooded spray bar and applicator that maintain proper nozzle height.

.e. A positive shut-off for the spray bar and a hand spray (with hose) equipped with a positive shut-off at the spray gun.

.f. A thermometer installed in the distributor tank to measure the temperature of the rejuvenation product at the time of the application.

.g. A tachometer calibrated to a minimum of tenths of miles per hour.

.h. A chart listing the capacity of the tank (in gallons) for each one (1) inch of depth. A chart showing speed/pressure application rates must also be included.

6XX-4.4 Cleaning and Preparing Existing Surface.

.a. Prior to placing the rejuvenation product, the surface of the pavement must be clean and free of all vegetation, rubber deposits, oil/fuel spills, debris, dust, dirt, or other loose foreign matter to the satisfaction of the engineer.

.b. Cracks that are ¼ inch wide or greater must be routed and cleaned prior to application of the rejuvenation product in accordance with the instructions of the selected joint sealer. The cracks must be sealed with a hot-pour joint sealant compatible with the rejuvenation product as approved by the engineer subsequent to rejuvenation acceptance in accordance with the paragraph titled – REJUVENATION ACCEPTANCE.

6XX-4.5 Application of Rejuvenation Product.

.a. Following preparation and subsequent inspection of the surface, the rejuvenation product shall be uniformly applied over the surface to be treated at the approved rate with an allowable variation from the approved rate of application of plus or minus 5 percent, in accordance with ASTM D 2995.

.**b.** Materials shall be applied at the temperature recommended by the manufacturer.

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To obtain uniform application of the material on the surface treated at the junction of previous and subsequent applications, heavy paper or cardboard, equivalent technique, must be spread on the surface at a sufficient distance back from the ends of each application so that the material may be started and stopped on the paper. Immediately after application, the building paper must be removed and properly disposed.

Areas missed by the distributor must be properly treated with the hand spray.

Following application of the rejuvenation product, the surface should not be disturbed for a period of at least 24 hours.

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.c. Other rejuvenation product application procedures include:

- Calibration Test - contractor must furnish all equipment, materials, and labor necessary to calibrate the bituminous distributor or other application equipment. Calibration must be made with approved job material and prior to applying the rejuvenation product to the prepared surface. Calibration of the bituminous distributor and the specialized bituminous spray applicator must be in accordance with ASTM D 2995.
- Excess Rejuvenation Product Removal - Manufactured sand, as approved by the engineer, must be provided by the contractor and must be spread in sufficient quantity to effectively blot up any excess rejuvenation product remaining on the treated pavement surface after 24 hours.
- Ponding and Puddling of Rejuvenation Product - If low spots and depressions in the pavement surface cause ponding or puddling of the rejuvenation product, the pavement surface must be broomed with a broom drag. Brooming should continue until the pavement surface is free of any pools of excess material. Ponding and/or puddling must not cause excess pavement softening and/or additional distress. The engineer must inspect and approve areas after 'brooming.'
- Excess Runoff of Rejuvenation Product - The application rate should be reduced, and the engineer notified, if the surface grade of the pavement surface causes excessive runoff of the rejuvenation product. Additional rejuvenation product, if necessary, may be subsequently applied after the first application of material has penetrated into the pavement to achieve the required properties of the treated binder
- Insufficient Rejuvenation Product - When it is determined by the engineer that the actual application rate of the rejuvenation product is more than 5 percent below the approved application rate, subsequent applications of materials must be made to bring the actual application rate up to the approved rate; additional rejuvenation product must penetrate into the pavement surface within 24 hours after application. Multiple applications if required may at the discretion of the engineer, require additional pavement sampling and rejuvenation testing to assure compliance with Table 1 or 2 of 6XX-2.1.

6XX-4.6 Cure Time Remedial Option - Application of Sand.

a. The contractor must apply sand to the surface of the treated asphalt pavement(s) if the rejuvenation product does not meet the cure time requirement and/or the frictional characteristics (skid resistance) have been reduced to a level not acceptable to the engineer. An unacceptable level of frictional characteristics (skid resistance) is defined in 6XX – 6.4.

b. The manufactured sand must be dry, hard, durable, free from clay, salt and foreign matter and well graded (100 percent passing #8 sieve and less than 10 percent passing #200 sieve). The sand must be uniformly applied at a rate of 3.0 lb/yd^2 $\pm$ 0.5 lb/yd^2, rolled (as recommended by the contractor and accepted by the engineer) into the treated surface and with any surplus removed with a power broom, or as directed by the

engineer. The contractor is responsible for all materials, equipment, and costs associated with the application of sand.

c. All manufactured sand or approved substitute used during the treatment must be removed as soon as practical after treatment of a pavement and prior to opening any airfield runway, taxiway, etc. This should be accomplished by a combination of hand and mechanical sweeping. All turnouts must be cleaned of any sand to the satisfaction of the engineer. Pavement sweeping will be included in the price bid per square yard for asphalt rejuvenation product.

d. If, after sand is swept and in the opinion of the engineer, a hazardous condition exists on the pavement, the contractor must apply additional sand and sweep same immediately following reapplication. No additional compensation will be allowed for reapplication and removal of sand.

QUALITY CONTROL

6XX-5.1 Manufacturer Representation. The contractor must have a manufacturer's authorized representative on the job site at the beginning of the work and during all rejuvenation product application. The manufacturer's representative must have knowledge of the material, procedures, and equipment described in the specification and will be responsible for determining the application rates and must oversee the preparation and application of the rejuvenation product. Documentation of the manufacturer representative's experience and knowledge for applying the rejuvenation product must be furnished to the engineer a minimum of 10 work days prior to placement of the test sections. The cost of the manufacturer's representative will be included in the bid price.

6XX-5.2 Quality Control Plan. The contractor must submit a quality control plan to the engineer a minimum of 10 days prior to applying test sections in accordance with 6XX-3.1. The quality control plan must address all items that affect the quality of the rejuvenation application including, but not limited to:

.a. Qualification of personnel.

.b. Schedule for the project.

.c. Procedure to monitor the weather/temperature limitations.

d. Inspection requirements including rejuvenation product, test sections, storage of rejuvenation product, preparation of the pavement surface, and equipment calibration.

e. Provisions for obtaining, packaging and shipping acceptance samples and repair of the pavement.

. f. Provisions for sample testing, testing laboratory name, location, accreditation, contact person, all contact information, testing requested, and report on information.

6XX-5.3 Warranty. The contractor must provide a manufacturer's/applicator warranty that the treated pavement will retain the lower binder properties of Table 1 or 2, for a period of two (2) years from the date of treatment. For compliance with the warranty, the owner may obtain cores and perform tests in accordance with REJUVENATION ACCEPTANCE. The contractor must further warrant that from the date the rejuvenation product was applied, the material will not flake, peel, chip, spall, nor otherwise contribute to or accelerate the aging of the pavement. The contractor must reapply the rejuvenation product, as necessary, or provide remedial actions at no cost to the owner, and/or refund all payments at the owner's discretion.

REJUVENATION ACCEPTANCE

6XX-6.1 Product Sampling. The Engineer will take samples of the rejuvenation product proposed for use upon delivery of each shipment in accordance with ASTM D 140 and store in accordance with MSDS, Section VII for a period of at least six months after payment in accordance with Paragraph 6XX-8.1. Testing, as necessary, will be accomplished by the Engineer to verify information provided by the MSDS information.

6XX-6.2 Freight and Weigh Bills. The Contractor must furnish the Engineer receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, of the rejuvenation product used in the construction covered by the contract. The Contractor shall not remove rejuvenation product from the tank car or storage tank until the initial outage and temperature measurements have been taken by the Engineer, nor shall the car or tank be released until the final outage has been taken by the Engineer.

6XX-6.3 Field Sampling Procedures. Sampling of the pavement sections to be treated must be performed before and after the pavement has been treated with the rejuvenation product. The contractor will be responsible for obtaining all pavement core samples or equivalent surface area samples as approved by the engineer for testing. At the discretion and approval of the engineer, the before samples collected and tested for application may suffice for before samples for acceptance.

.a. A minimum of six (6) pavement core samples or equivalent surface area samples must be taken from each different pavement covered by the Plans. At each sampling location, three (3) cores or equivalent samples must be taken before the rejuvenation product is placed and three (3) cores or equivalent samples after treatment of the pavement. The comparative pavement cores must be taken close to the same location, at a minimum within the same paving lane and within one foot of each other. All pavement cores taken by the contractor must be six (6) inches in diameter or surface area equivalent samples. The contractor must repair any sample holes resulting from the removal of asphalt concrete pavement cores or equivalent surface area samples (with suitable materials and methods as approved by the engineer) at no cost to the owner.

b. The pavement core or equivalent surface area samples must be taken 30-45 days after application of the rejuvenation product.

c. A minimum of one series of pavement cores or equivalent surface area samples must be performed for each 30,000 square yards or fractional part of treated pavement section per pavement plan or as required by the engineer. Sample locations should be determined by the engineer on a random basis in accordance with the procedures contained in ASTM D 3665.

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It is recognized, the rate of recovered viscosity reduction in addition to product type and application rate is influenced by the climatic conditions and time of exposure prior to sampling and testing. All means to standardize these parameters should be taken. Time factor and weather conditions for all should be noted and recorded.

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d. Pavement core samples or equivalent surface areas samples must be placed in labeled sealable plastic bags immediately after taking, cleaning and removing sampling water (blotting). The sealed samples must then be placed in labeled plastic core canisters. For equivalent surface area samples, an equivalent processing for the sample is required as approved by the engineer. The specimens must be shipped to the designated laboratory within 24 hours of collection.

6XX-6.4 Rejuvenation Testing Responsibility. All acceptance testing necessary to determine conformance with this specification must be performed by the engineer, or accredited independent test agency, to verify that the rejuvenation product achieves the minimum decrease in the asphalt binder properties as measured from binder in the top 3/8 ± 1/32 inch of the samples.

6XX – 6.5 Rejuvenation Testing. Tests must be conducted to extract the bituminous binder from the top 3/8 ± 1/32 inch of the cores/slabs precisely cut from the field specimens.

.a. Binder extraction must be by ASTM D 2172, Method A (centrifuge) with toluene, and recovered according to ASTM D 1856 (Abson Method) or ASTM D 5404 (Roto-Vap Method).

- Viscosity of the bituminous material must be measured in accordance with ASTM D 2171. The percent decrease in the binder properties must be computed as follows:

100 [(absolute viscosity, P, of untreated sample) – (absolute viscosity, P, of treated sample)] / (absolute viscosity, P, of untreated samples)

- The complex modulus, G^*, kPa, must be measured in accordance with AASHTO T 315 C, at 60°C (140°F) 10 rad/sec or other recorded frequency. The percent decrease in the binder properties must be computed as follows:

100 [(complex modulus, G*, kPa of untreated sample) – (complex modulus, G*, kPa, of treated sample)] / (complex modulus, G*, kPa, of untreated samples)

The complex viscosity, η*, at 60°C (140°F) must be calculated and reported from the complex modulus, G* and angular frequency, ώ (radians/sec).

.b. Test results for absolute viscosity, complex modulus (and viscosity), and phase angle must be reported. The maximum percent reduction calculated for absolute viscosity or complex modulus must be considered in BASIS OF PAYMENT.

.c. In the event of binders recovered from aged pavements and/or pavements using polymer modified binders (before treatment) exhibiting absolute viscosities ≥ 200,000 P (data becomes suspect, viscosity exceeds test capabilities) the viscosity reduction compliance requirement should be determined based on the complex modulus, G^*, kPa.

6XX-6.6 Skid Resistance. Special attention must be afforded to skid resistance based on the use of the pavement surfaces.

.a. For Runway and High Speed Taxiway Exit Surfaces. The pavement surface areas treated with rejuvenation product must be tested for skid resistance a minimum of forty-eight (48) hours after application of the rejuvenation product. The results of the skid tests must be equal or greater than the Maintenance Planning skid values provided in TABLE 3-2, FRICTION LEVEL CLASSIFICATION FOR RUNWAY PAVEMENT SURFACES, in AC 150/5320-12, *Measurement, Construction, and Maintenance of Skid-resistant Airport Pavement Surfaces*, Table 3-2, when tested at the speed of 40 mph with approved continuous friction measuring equipment [CFME].

.b. For Taxiway and Apron Surfaces. The skid resistance for taxiway and apron surfaces must be inspected by the contractor and engineer a minimum of forty-eight (48) hours after application of the rejuvenation product. In the event the skid resistance of these surfaces is determined to be unacceptable by the engineer, the contractor must exercise 6XX-4.6. Cure Time Remedial Option – Application of Sand.

METHOD OF MEASUREMENT

6XX-7.1 Asphalt Crack Preparation and Seal. The quantity of asphalt crack preparation and seal to be paid for must be the number of linear feet performed in accordance with the plans and specifications and accepted by the engineer.

6XX-7.2 Asphalt Rejuvenation. The quantity of rejuvenation product to be paid for will be the number of square yards performed in accordance with the plans and specifications and accepted by the engineer. The contractor must furnish the engineer with the certified

weigh bills when materials are received for the rejuvenation product used under this contract. The contractor must not remove material from the tank car or storage tank until initial amounts and temperature measurements have been verified.

BASIS OF PAYMENT

6XX-8.1 Payment. Payment for accepted rejuvenation product will be made at the contract unit price per square yard (square meter) for bituminous rejuvenation adjusted according to 6XX-8.1.a. Payment for the crack preparation and seal will be made at the contract unit price per linear foot (linear meter).

.a. Basis of Adjusted Payment. The payment for accepted rejuvenation product must be calculated in accordance with Table #3.

Table 3. Rejuvenation Pay Reduction.

Binder Rejuvenation at Acceptance; % Reduction in Absolute Viscosity or Complex Modulus		**% Payment**
Pavement More Than Three Years in Age	**Pavement Less Than Three Years in Age**	
≥ 30	**≥ 20**	**100**
20.0 - 29.9	**10.0 - 19.9**	**90**
Less than 20.0	**Less than 10.0**	**No payment**

.b. Final Payment. Final payment will be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item. Payment will be made under:

Item P-6XX-1	Asphalt Crack Preparation and Seal - per linear foot (linear meter)
Item P-6XX-2	Asphalt Rejuvenation - per square yard (square meter)

TESTING REQUIREMENTS

ASTM D 140	Standard Practice for Sampling Bituminous Materials
ASTM D 1856	Standard Test Method for Recovery of Asphalt from Solution by Abson Method

ASTM D 2171	Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer
ASTM D 2172	Standard Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 2995	Standard Practice for Estimating Application Rate of Bituminous Distributors
ASTM D 3549	Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens
ASTM D 3665	Standard Practice for Random Sampling of Construction Materials
ASTM D 5340	Standard Test Method for Airport Pavement Condition Index Surveys
ASTM D 5404	Standard Practice for Recovery of Asphalt from Solution Using the Rotary Evaporator
AASHTO T 315	Standard Method of Test for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)

End of Item P-6XX